

**LEPTIDEA REALI REISSINGER 1989 (LEP.: PIERIDAE):
A BUTTERFLY NEW TO BRITAIN AND IRELAND**

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Introduction

In 1988, a new species of *Leptidea*, *L. lorkovicii*, was described from specimens collected in the French Pyrenees by Réal as documented by Lorković (1993). This species, now known as *Leptidea reali* Reissinger, was distinguished from its sibling *sinapis* L. on the basis of differences in the female genitalia. Subsequent work by Lorković (1993) showed that there were also consistent differences in the male genitalia of both species. Mazel & Leestmans (1993) further state that they could not find any apparent intermediates between the two species. European studies have shown that morphological differences between the two species were slight and inconsistent in adults, but minor differences were reported in the form and colour of the pupae (Lorković, 1993). It was also shown that female *reali* would not mate with male *sinapis* (Lorković, 1993).

In the Pyrenees it was found that *reali* does not occur below 600m, but *sinapis* was found right down to sea level (Mazel and Leestmans, 1996). However above 1600m only *sinapis* appeared to be present (though this needed more data) (Mazel and Leestmans, 1996). Other studies in Europe have shown that *L. reali* occurs in Austria, Belgium, Croatia, Denmark, France (including Corsica), Poland, Slovenia, Spain, Sweden, Switzerland and Ukraine (Lorković, 1993; Mazel & Leestmans, 1996; Karsholt, 1999). *Leptidea sinapis* occurs also throughout much of this area. A map showing the distribution of the species in departments of France and in adjoining countries is given in Mazel and Leestmans (1996). This shows *reali* mainly in south and east France sympatrically with *sinapis*. Away from the south and east, only a few records are mapped and only *sinapis* was found here. Mazel and Leestmans (1996) indicate that only *sinapis* was found in Corsica, though the opposite is reported by Lorković.

In Britain and Ireland the Wood White *Leptidea sinapis* sensu lato is found in England, Wales and Ireland. The historic and current distribution is mapped in Asher *et al.* (2001). In Britain the Wood White underwent a large decline and was lost from 62% of its recorded range in the 20th Century (Asher *et al.*, 2001). Just 70 colonies are thought to survive (Warren & Bourn, 1998). Contrastingly in Ireland the species has increased, though this may have ceased or even reversed in recent years (Asher *et al.*, 2001). In Britain the species lives up to its common name. Most colonies are found in woodland

rides and glades or in grassland/scrub mosaics (Warren and Bourn, 1998). In Ireland the species occurs in apparently more open habitats (Rippey, 1986) and it has increased since 1945, initially due to it spreading along old railway lines (Heal, 1965). Irish populations have been described as a different subspecies *juvernica* Williams based on the more intensely coloured wings (Williams, 1946).

The separation of *L. reali* from *L. sinapis* can only be done by examination and measurement of male and female genitalia. The genitalia of both sexes of *reali* and *sinapis* are illustrated photographically in Lorković (1993) and Karsholt (1999) and by drawings in Mazel and Leestmans (1996). Table 1 summarises the difference in the lengths of the aedeagus of both species from Lorković (1993) and Karsholt (1999). Non-overlapping measurements were found in the lengths of the saccus of males and the ductus bursae of the females by Lorković (1993) and Karsholt (1999). Note that while there is no overlap apparent in the measurement of specimens from the same geographical area, a slight overlap is apparent when the data from the three areas is pooled. Lorković (1993) observed that the measurements from eastern specimens (Croatia) were smaller than conspecifics in Spain suggesting an east west cline. He said that this was without explanation but it was not a factor of body size as Spanish *sinapis* were smaller than Croatian specimens. This east west cline is supported by the measurements from Denmark.

	<i>L. reali</i>	<i>L. sinapis</i>
Croatia – males	1.64 - 1.82 - 2.02 (n = 40)	1.33 - 1.50 - 1.60 (n = 35)
France/Spain – males	1.82 - 1.96 - 2.10 (n = 5)	1.37 - 1.56 - 1.70 (n = 10)
Denmark – males	1.80 - 1.97 - 2.10 (n = 13)	1.60 - 1.63 - 1.70 (n = 7)
Croatia – females	0.77 - 0.91 - 1.01 (n = 24)	0.48 - 0.56 - 0.64 (n = 17)
France/Spain – females	0.80 - 0.91 - 0.96 (n = 7)	0.63 - 0.64 - 0.65 (n = 3)
Denmark – females	0.90 - 0.95 - 1.0 (n = 8)	0.60 - 0.66 - 0.70 (n = 5)

Table 1. Minimum, mean (in bold) and maximum lengths in millimetres of the aedeagus of *L. reali* and *L. sinapis* from Croatia and France/Spain (source Lorkovic, 1993) and Denmark (source Karsholt, 1999). In Lorkovic the minimum measurement of *sinapis* from Spain is given as 0.37, we believe in error for 1.37.

Methods

We have examined 34 British Isles specimens from a variety of sources (Appendix 1). No specimens were selected on the basis of any perceived morphological differences. MH dissected the specimens and made a slide preparation of the genitalia and abdomens. The length of the aedeagus and ductus bursa were measured using a graticule. We have not used the saccus as this can be difficult to measure. Pictures of some of the dissected genitalia and the full data can be viewed at the following address <http://www.irishmoths.fsnet.co.uk>, or by contacting the authors.

Results

Our results show that *L. sinapis* is present in both England and Ireland, but *L. reali* is only *certainly* found in Ireland (Table 2 and Appendix 1). Amongst the material collected by Gainsford in the Ulster Museum, which we believe is solely of English origin, there was a single *reali* specimen. Unfortunately this was unlabelled, so we must consider the status of *reali* in England as unconfirmed. All the Irish *sinapis* were collected in the Burren, Co. Clare and only *reali* was found in the rest of Ireland.

Elsewhere in Europe, the two species occur sympatrically, e.g., in Croatia and the Pyrenees. In Denmark, both species have been recorded in the past, but *L. sinapis* is now extinct. The only extant Danish populations are on the island of Bornholm and these conform to *L. reali* (Karsholt 1999).

	<i>L. reali</i>	<i>L. sinapis</i>
England - males	–	1.36 - 1.58 - 1.70 (n = 11)
Ireland - males	1.81 - 1.95 - 2.10 (n = 7)	1.54 - 1.63 - 1.63 (n = 2)
England - females	–	0.52 - 0.60 - 0.66 (n = 4)
Ireland - females	1.11 - 1.11 - (n = 2)	0.59 - 0.64 - 0.66 (n = 7)

Table 2. Minimum, mean (in bold) and maximum lengths in millimetres of the male aedeagus and the female ductus bursa of *L. reali* and *L. sinapis* from England and Ireland. The Gainsford *L. reali* specimen is not included.

Discussion

Our results have demonstrated the presence of *L. reali* in Ireland and possibly in Britain. This is the first new butterfly species discovered in Britain and Ireland since the Essex Skipper *Thymelicus lineola* (Ochs.) was recognised in 1889 (Emmet & Heath, 1989). These are clearly initial findings. More research is needed to determine the precise distribution and status of each species and matters which need to be addressed include the following:

- Does *reali* occur in England (remembering that the Gainsford specimen is unlocalised)?
- What is the distribution of each species in Britain and Ireland and to what extent are they sympatric?
- Which species are still extant? We only have proof that *L. reali* is extant in Ireland.
- Following on from this, which species occur in the declining colonies in England? Is this just one species or both? The need to conserve all remaining populations of the “Wood White” is reinforced by this finding.

- Any reintroduction plans, which in any case should only be done after detailed consultation and with all legal consents, need to be totally re-evaluated in light of the results presented here.
- There is a need to evaluate morphological characters for field separation of these species.
- If others can contribute, a joint study of as many specimens as possible across Britain and Ireland is clearly desirable.

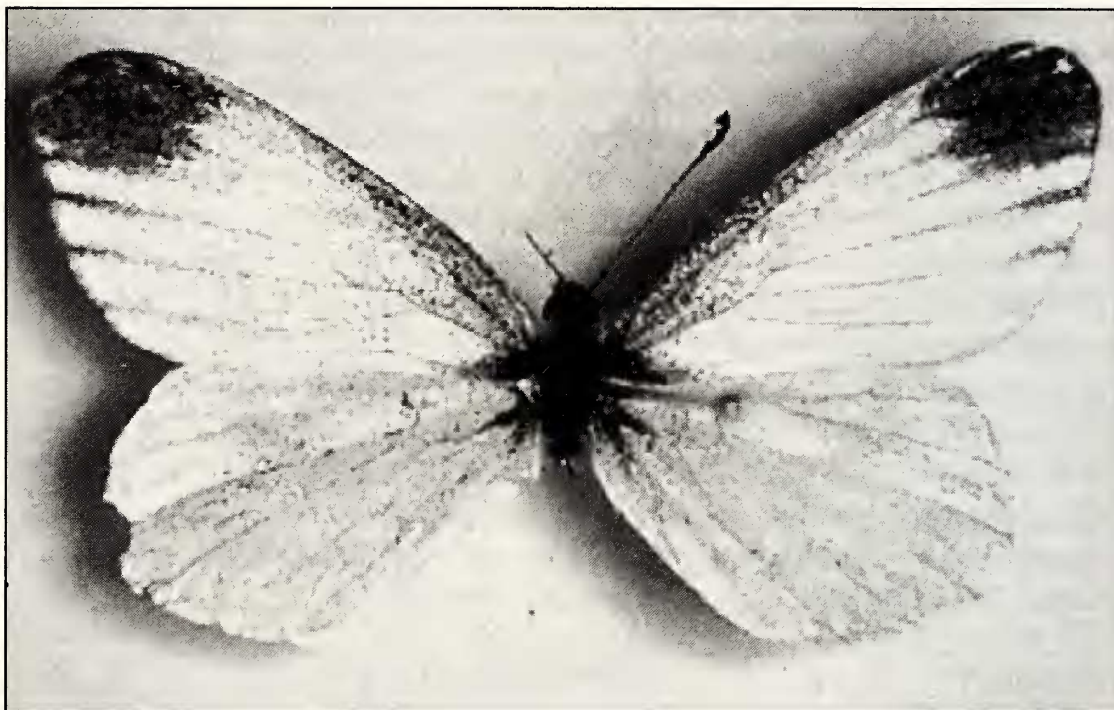


Plate G. *Leptidea reali*, Northern Ireland, June 2000

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APPENDIX 1: Sources of *Leptidea* specimens examined

ENGLAND

L. sinapis

- Salcey Forest, Northamptonshire, July 1977 and June 1978, 4 males & 3 females, Martin Warren;
- Yardley Chase, Northamptonshire, 1978, 1 male, Martin Warren;
- Woodbury, Devon (?), 1969, 1 male, Gainsford collection, Ulster Museum;
- Unknown locality, mid 1970s, 1 male, Walter Veale;
- Plaistow, West Sussex, 14 June 1942, 2 males, Gainsford collection, Ulster Museum;
- Loxwood, 14 July 1942, 1 female, Gainsford collection, Ulster Museum.

IRELAND

L. reali

- The Umbra, Co. Londonderry, June 2000, 2 males, Brian Nelson, Ulster Museum;
- Rathdrum, Co. Wicklow May 1949, 1 male, R. F. Haynes, Ulster Museum;
- Ballydugan Lake, Co. Down, July 1975, 1 male, Walter Veale;
- near Enniskillen, Co. Fermanagh, 1 female, R. F. Haynes, Ulster Museum;
- Hillsborough, Co. Down, 31 May 1971, 1 female, J Haslett, Ulster Museum;
- Townley Hall, Co. Louth, 23 June 1973, 1 male, J Haslett, Ulster Museum;
- Barrigone, Co. Limerick 5 June 1989, 1 male, J. W. Lavery, Ulster Museum;
- Dromore Forest, Co. Clare, 29 May 1978, 1 male, Martin Warren.

L. sinapis

- Ballyvaughan, Co. Clare, 19 June 1981, 1 male, R. F. Haynes, Ulster Museum;
- Cloncoose [Clooncoose], Co. Clare, 7 July 1985, 2 females, J. W. Lavery, Ulster Museum;
- Burren Co. Clare, 16 June 1984, 4 females, J. W. Lavery, Ulster Museum;
- Burren, Co. Clare, 28 May 1978, 2 males and 1 female, Martin Warren.

UNKNOWN

L. reali

- 1 male, Gainsford collection, Ulster Museum.